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OBSERVATIONS ON TWO THREATENED ARECOID PALMS OF NICOBAR ISLANDS CULTIVATED AT THE INDIAN BOTANIC GARDEN, HOWRAH

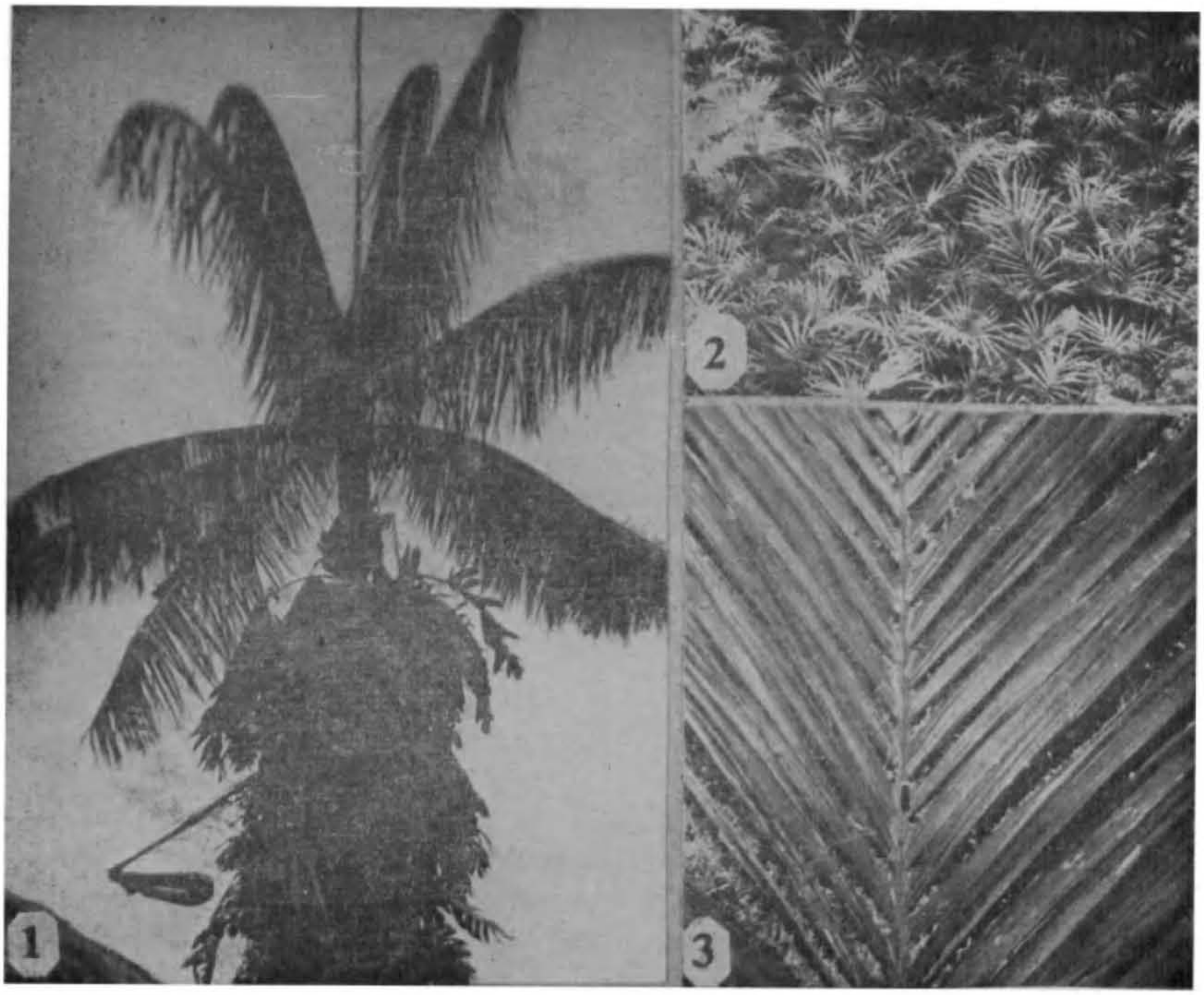
INTRODUCTION

During one and half century many exotic and indigenous palms were introduced at the Indian Botanic Garden, Howrah (Long. 88°21′ east/Lat. 22°35′ North, Temp. 21°C-31°C, Rainfall 1536 mm, Alt. 4.57 m), among them were two rare arecoid palms *Rhopaloblaste augusta* (Kurz) H. E. Moore and *Bentinckia nicobarica* (Kurz) Beccari both natives of Nicobar Islands and seldom seen in cultivation. In a recent report these two arecoid palms were declared as threatened at their natural habitat. It is heartening that they were introduced and cultivated at the Garden, long before the campaign for conservation of threatened plants was felt necessary. Plenty of live materials are now available in the Garden, which provided the author a very good opportunity to study both the palms in detail, particularly their performance after introduction. A brief description of each species and an account on their culture may help in identification and serve as a prerequisite for their further introduction and conservation.

Rhopaloblaste augusta (Kurz) H. E. Moore in Principes 14 : 79. 1970. *Areca augusta* Kurz in Jour. Bot. 4 : 331. pl. 170. figs. 1-10. 1875. Type : Nicobar Islands : Kamorta : Kurz s.n. Feb. 1875 (CAL !). Pl. I, figs. 1-3.

Stem solitary, columnar, annulate. Leaves pinnate, deep green, 3-4 m long ; leaflets pendulous, linear, opposite to sub-opposite, each 1 m × 3-4 cm. Inflorescence decompound, *ca* 1 m long. Outer spathe broadly oblong, semi-woody, bicarinate with hard beak-like apex. Flower clusters in protandrous triads with a middle female flower and two lateral male flowers. Each triad is subtended by a lip-like bract. Male flowers symmetric with 3-distinct imbricate sepals and 3-valvate petals. Stamens 6 ; filaments adnate to corolla at base. In female flowers staminodes united into six membraneous 6-lobed ring. Ovary 3-loculed. Fruit ovoid to ellipsoid, 1-2 seeded, rarely 3-seeded. Seed ovoid, planoconvex, 1.2-1.4 cm × 9-11 mm ; endosperm deeply ruminate.

Phenology and cultural notes : In the Indian Botanic Garden, Howrah, a tree in average produces 3 inflorescences during the period from June to August. The first inflorescence after emerging from the leaf-sheath and spathes takes about 2 months to complete anthesis in the staminate flowers followed by the pistillates. In the first inflorescence fruits start maturing from January. Fruiting is less pronounced in the second and third inflorescences. Freshly harvested seeds take about 24 days to germinate in a compost medium. The first sheath of the seedling is nonchlorophyllous. Eophyll is paripinnate, each 7-11 cm long ; pinnae of the eophyll are opposite to sub-opposite. Seedlings are slow growing, each taking about 3 years to attain a height of



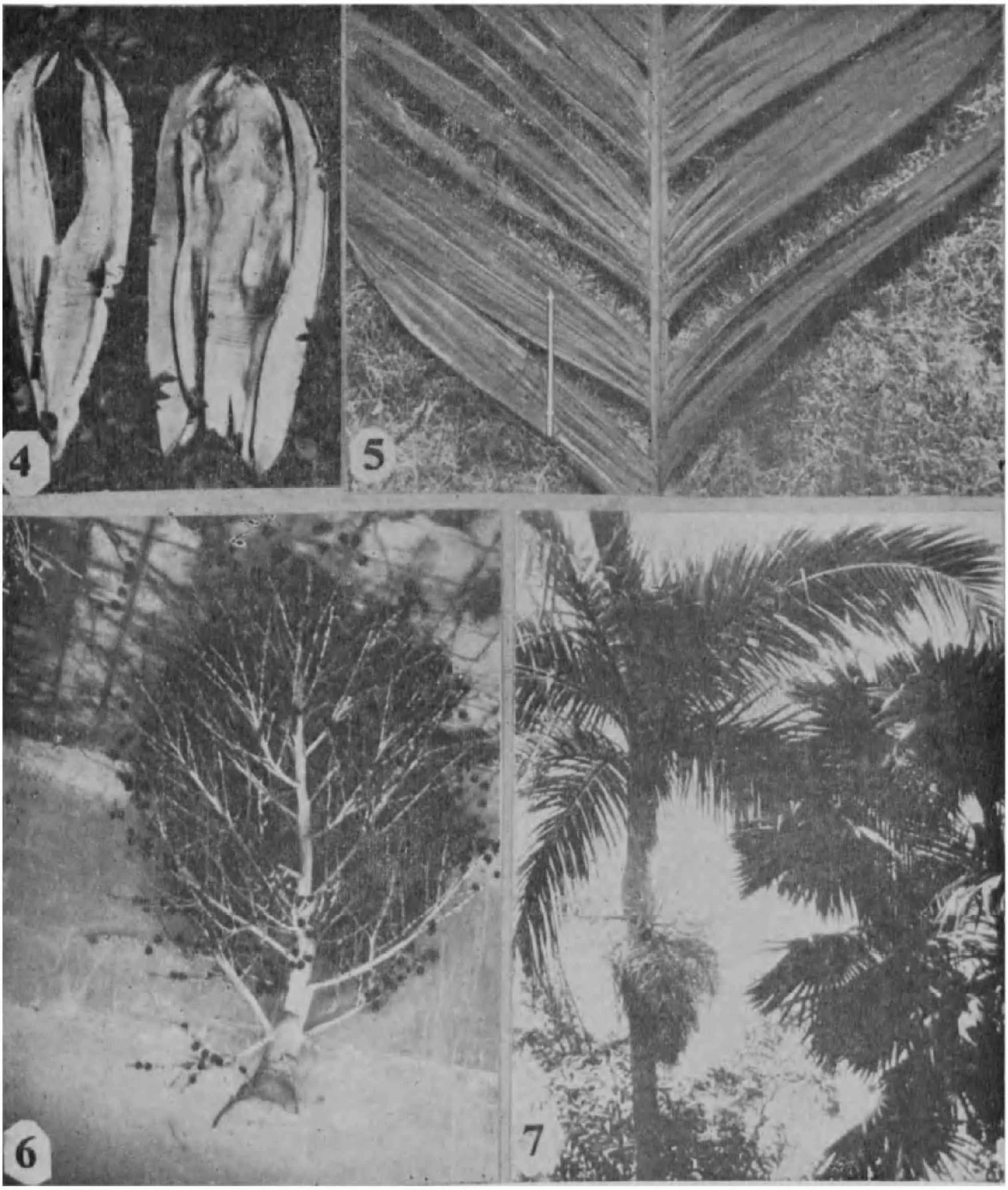
Rhopaloblaste augusta (Kurz) H. E. Moore

Plate I (Figs. 1-3) : 1. Habit (*Rhaphidophora decursiva* Schott—a climber on the stem). 2. Seedlings germinated spontaneously. 3. Leaf showing alternate and sub-opposite pinnae on the leaf rachis.

60 cm only. Seedlings stagger if planted in the open because the strong mid day sun from March to June quickly dessicates the luxuriant green foliages of the seedlings. The cool shady humid condition of the large Palm House simulates the best natural environment for their healthy growth. Some trees have already attained maturity and are bearing fruits. The damp floor of the large Palm House with plenty of accumulated humus and moisture helps natural regeneration of seedlings in large numbers. Sometimes 3 seedlings developing simultaneously from a 3-seeded fruit.

Bentinckia nicobarica (Kurz) Beccari in Ann. Buitenz. 2 : 165. 1885 ; Becc. & Hook. f. in Hook. f. Fl. Brit. Ind. 6 : 418. 1892. *Orania nicobarica* Kurz in Journ. Bot. 4 : 331. pl. 171. figs. 19-25. 1875. Type : Nicobar Islands : Kamorta, Kurz s.n. Feb. 1875 (CAL !). Pl. II, figs. 4-7.

Stem solitary, columnar, annulate ; upper part of the stem with long distinct crownshaft. Leaves pinnate, arching, *ca* 4 m long ; leaflets linear ; each 0.2-2 m long, 1-6 cm broad at middle, sometimes confluent at intervals. Inflorescence infrafoliar, decompound *ca* 1.5 m long. Outer spathe large, spatuliform, papyraceous with thick bicarinate margins. Flowers bracteolate, pitted: pits with 2-marginal lip-like villous bracts. Male flowers glumaceous, laterally compressed; sepals 3, hyaline, unequal; petals 3, fleshy at margins, longitudinally striated, valvate; stamens 6; filaments subulate,



Bentinckia nicobarica (Kurz) Becc.

Plate II (Figs. 4-7) : 4. Spathes (left inner spathe, right outer spathe). 5. Part of the leaf (segmented). 6. Infrutescence (with ripe fruits). 7. Habit (with one infrafoliar inflorescence).

fleshy, adnate to basal part of the corolla. Female flowers ovoid ; ovary slightly recepticulate, 1-loculed by abortion, 1-ovulate ; staminodes with 6-membraneous, linear appendages. Fruit 1-seeded, ovoid to subovoid, *ca* 1.5 × 1.2 cm, deep scarlet when ripe. Seed ovoid, *ca* 9 × 7 mm ; endosperm white, homogeneous.

Phenology and cultural notes : This palm is fast growing in cultivation and attains maturity after approximately 15 years of planting in the open. Plants grown in the conservatories are slender and take longer time to become fertile. A mature tree produces 3-4 inflorescences in each flowering season simultaneously with the emergence of new leaves from May to September. It has been observed that in each growing season the first six leaves that unfurl after withering of the last inflorescence of the previous season do not bear spadices in their axils. The first inflorescence takes about 60 days from emergence to the commencement of anthesis in male flowers. Since the flower clusters are sunken, alternate bursting of male flowers occur from apparently smooth spikes. It has also been observed that female flowers open immediately after completion of anthesis in males. There is no period of quiescence between the anthesis of male and female flowers, although it is not simultaneous in all the spikes in the same inflorescence, thus causing overlapping of both the sexes for ensuring cross pollination. Fruit setting is generally abundant in the first and second inflorescences. Fresh seeds take about 55-60 days to germinate in compost medium. Spontaneous germination below the tree is rare. The first sheath of the seedling is nonchlorophyllous, the second sheath tubular and truncate at rim and the third sheath slightly greenish and obliquely truncate. Eophyll bilobed, each lobe *ca* 20 × 5 cm, acuminate and toothed. Primary root of the seedling degenerates after 4th week of germination with the development of adventitious roots.

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